

A

LAW OFFICES OF

BIELEN, PETERSON & LAMPE

A PROFESSIONAL ASSOCIATION

1990 N. CALIFORNIA BLVD.

SUITE 720

WALNUT CREEK, CALIFORNIA 94596-3775

TELEPHONE: (925) 937-1515

FAX: (925) 937-1529

SACRAMENTO OFFICE

(916) 961-1500

ATTORNEY DOCKET: 1322

EXPRESS MAIL NO: EE903112116US

THEODORE J. BIELEN, JR.

A PROFESSIONAL CORPORATION

RICHARD ESTY PETERSON

THOMAS R. LAMPE

PATENTS, TRADEMARKS & COPYRIGHTS

ASSISTANT COMMISSIONER OF PATENTS

WASHINGTON, D.C. 20231

Sir:

Transmitted herewith for filing is the patent application of

Inventor/Owner: WILSON et al

For: DEVICE FOR APPLYING STIMULI TO A SUBJECT

Enclosed are:

- ☒ 3 sheet(s) of informal drawings.
 - ☐ An assignment of the invention to _____.
 - ☐ A certified copy of a _____ application.
 - ☐ _____ Specimens (2 minimum)
 - ☒ A Verified Statement to establish small entity status under CFR 1.9 and 37 CFR 1.27.
 - ☒ Declaration/Statement and Power of Attorney.
 - ☒ Specification and Claims.
 - ☒ 1 copy of prior art references listed on the PTO 1449 Form.
- The filing fee has been calculated as shown below:

FOR:	(Col. 1)	(Col. 2)	SMALL ENTITY		OTHER THAN A SMALL ENTITY	
	No. Filed	No. Extra	Rate	Fee	Rate	Fee
BASIC FEE				\$ 380.00		\$
TOTAL CLAIMS	-20*		x 9=	\$	x18=	\$
INDEP CLAIMS	- 3*		x39=	\$	x78=	\$
[] MULTIPLE DEP. CLAIM PRESENTED			x130=	\$	x260=	\$
Assignment				\$		\$

*If the difference in Col 1.
is less than zero, enter "0"
in Col 2.

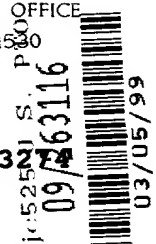
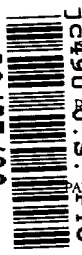
TOTAL \$ 380.00 TOTAL \$

- ☐ Please charge my Deposit Account No. 02-2273 in the amount of \$_____. A duplicate copy of this sheet is enclosed.
- ☒ A check in the amount of \$380.00 to cover all fees associated with this communication is enclosed.
- ☒ The Commissioner is hereby authorized to charge any additional required fees associated with this communication or any fees arising during the pending of this application, or credit any overpayment to Account No. 02-2273. A duplicate copy of this sheet is enclosed.
- ☒ EXCEPT the issue fee set forth in 37 CFR 1.18 only upon the return of the executed Issue Fee Transmittal Form PTOL 85b, under 37 CFR 311(a) to the office.
- ☒ Post Card.

Date: March 5, 1999

THEODORE J. BIELEN, JR.
Reg. No. 27,420

03/05/99



Applicant or Patentee: **WILSON et al**

Serial or Patent No:

Filed or Issued:

For: **DEVICE FOR APPLYING STIMULI TO A SUBJECT**

Attorney's

Docket No: **13274**

VERIFIED STATEMENT (DECLARATION) CLAIMING SMALL ENTITY
STATUS (37 CFR 1.9(f)-INDEPENDENT INVENTOR

As a below named inventor, I hereby declare that I qualify as an independent inventor as defined in 37 CFR 1.9(c) for purposes of paying reduced fees under section 41(a) and (b) of Title 35, United States Code, to the Patent and Trademark Office with regard to the invention entitled: **DEVICE FOR APPLYING STIMULI TO A SUBJECT** described in

☒ the specification filed herewith
☐ application serial no. _____, filed _____
☐ patent no. _____, issued _____

I have not assigned, granted, conveyed or licensed and am under no obligation under contract or law to assign, grant, convey or license, any rights in the invention to any person who could not be classified as an independent inventor under 37 CFR 1.9(c) if that person had made the invention, or to any concern which would not qualify as a small business concern under 37 CFR 1.9 (d) or a nonprofit organization under 37 CFR 1.9(e).

Each person, concern or organization to which I have assigned, granted conveyed, or licensed or am under an obligation under contract or law to assign, grant, convey, or license any rights in the invention is listed below:

☒ no such person, concern, or organization
☐ persons, concerns or organizations listed below*

*NOTE: Separate verified statements are required from each named person, concern or organization having rights to the invention averring to their status as small entities. (37 CFR 1.27)

FULL NAME: **NONE**

ADDRESS: **NONE**

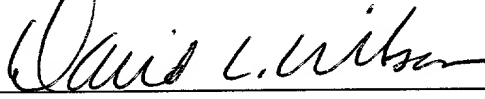
☐ INDIVIDUAL ☐ SMALL BUSINESS ☐ NONPROFIT ORGANIZATION

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate.
(37 CFR 1.28(b))

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

NAME OF INVENTOR: **David L. Wilson**

Signature of Inventor: _____



Date: 2/22/99

NAME OF INVENTOR: **Douglas C. Fisher**

Signature of Inventor: _____

Date: _____

Applicant or Patentee: **WILSON et al**

Attorney's

Serial or Patent No:

Docket No: **13274**

Filed or Issued:

For: **DEVICE FOR APPLYING STIMULI TO A SUBJECT**

VERIFIED STATEMENT (DECLARATION) CLAIMING SMALL ENTITY
STATUS (37 CFR 1.9(f)-INDEPENDENT INVENTOR

As a below named inventor, I hereby declare that I qualify as an independent inventor as defined in 37 CFR 1.9(c) for purposes of paying reduced fees under section 41(a) and (b) of Title 35, United States Code, to the Patent and Trademark Office with regard to the invention entitled: **DEVICE FOR APPLYING STIMULI TO A SUBJECT** described in

☒ the specification filed herewith
☐ application serial no. _____, filed _____
☐ patent no. _____, issued _____

I have not assigned, granted, conveyed or licensed and am under no obligation under contract or law to assign, grant, convey or license, any rights in the invention to any person who could not be classified as an independent inventor under 37 CFR 1.9(c) if that person had made the invention, or to any concern which would not qualify as a small business concern under 37 CFR 1.9 (d) or a nonprofit organization under 37 CFR 1.9(e).

Each person, concern or organization to which I have assigned, granted conveyed, or licensed or am under an obligation under contract or law to assign, grant, convey, or license any rights in the invention is listed below:

☒ no such person, concern, or organization
☐ persons, concerns or organizations listed below*

*NOTE: Separate verified statements are required from each named person, concern or organization having rights to the invention averring to their status as small entities. (37 CFR 1.27)

FULL NAME: **NONE**

ADDRESS: **NONE**

☐ INDIVIDUAL ☐ SMALL BUSINESS ☐ NONPROFIT ORGANIZATION

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate.

(37 CFR 1.28(b))

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

NAME OF INVENTOR: **David L. Wilson**

Signature of Inventor: _____

Date: _____

NAME OF INVENTOR: **Douglas C. Fisher**

Signature of Inventor: *Douglas C Fisher*

Date: 2/22/99

PATENT

DAVID L. WILSON

DOUGLAS C. FISHER

SPECIFICATION AND CLAIMS
* * * * *

FOR
* *

LETTERS PATENT
* * * * *

FOR
* *

DEVICE FOR APPLYING STIMULI TO A SUBJECT

THEODORE J. BIELEN, JR.
BIELEN, PETERSON & LAMPE
1990 N. California Blvd., Ste. 720
Walnut Creek, Ca. 94596

13274

DEVICE FOR APPLYING STIMULI TO A SUBJECT

ABSTRACT OF THE DISCLOSURE

A device for applying stimuli to a subject for therapeutic purposes utilizing an audio source producing a selected audio tone. An audio speaker delivers the audio stimulus to the left and right ears of the subject in an alternating manner, such that the sounds may be heard in either of the ears or may be heard in both of the ears in sequential fashion. Visual or tactile stimuli may be delivered to a subject singularly or simultaneously with the audio stimulus.

BACKGROUND OF THE INVENTION

It is known that Post-Traumatic Stress Disorder (PTSD) may be treated by providing a particular type of desensitization, known as eye movement desensitization reprocessing (EMDR). Early treatments centered on desensitization of eye movements.

Reference is made to United States Patent 5,343,261 to Wilson which revealed a novel device based on a treatment process first reported in an article entitled "Eye Movement Desensitization: A New Treatment For Post-Traumatic Stress Disorder" by F. Shapiro. In fact, the device for providing desensitizing eye movements described in this document has been successfully employed in the treatment of PTSD.

It has been proposed that other sensory stimuli may be utilized in a rhythmic manner to achieve the same effect. For example, the application of alternating auditory stimuli and/or tactile stimuli have achieved good results in the treatment of PTSD and many other emotional disorders.

A device which is capable of applying multiple stimuli, be it auditory, visual, or tactile, to a subject in a coordinated fashion would be a notable advance in the psychological treatment field.

SUMMARY OF THE INVENTION

In accordance with the present invention a novel and useful device for applying multiple stimuli to a subject for the treatment of trauma is herein provided.

5 The device of the present invention utilizes an audio source which provides a selected audio tone. Such audio tones may be internally generated or provided from an external source. The audio tones may be fed to audio speaker means, which may be in the form of a set of head phones. Each audio tone received may be
10 adjusted as to volume and speed. The audio speaker means may also deliver selected audio tones to the left and right ears of the subject in a discrete alternate manner. Such alternation may also include the sequence of all sound being delivered to the left ear, all sound being delivered to the left and rights ears, and all
15 sound being delivered to the right ear of the listener or patient. In this bridging manner, there is no time period in which sound is not being delivered to one of the ears of the listener. The audio tones may comprise pure notes or more complicated sonic patterns. Also, narratives such as, relaxation sounds, affirmations, prayers,
20 and the like, may be delivered bilaterally or alternately to a patient's ears. In addition, switch means may be provided for selecting either the internally generated audio source or an external audio source, according to the needs of the patient. Further, internally generated tones may consist of a single tone of
25 varying pitch or successive tones on a scale, e.g. a scale of eight notes (CDEFGABC).

Means may also be found in the present invention for providing a tactile output to the patient commensurate with the alternating delivery of the audio tones. Such tactile delivery may take the form of a tactile probe which is graspable by the user and is activated by an electrical signal which initiates vibration of the probe. The probe vibration is generated by conventional motors, solenoids or similar devices, which may be found within a housing or tubing.

Although the device of the present invention may be manually applied or started, initiation may derive from other sources. For example, means may be included for quantifying a variable body characteristic. Such body characteristics may take the form of the patient's pulse, body temperature, blood pressure galvanic skin response (GSR), eye blink rate, and the like. The particular body characteristic is quantified and averaged. An indicator is employed to measure the rate of change of the variable body characteristic. When such rate of change exceeds a certain predetermined amount, the delivery of selected audio tones may be altered accordingly. For example, a change in pulse rate may change the pitch of the tones being delivered alternatively to the ears of the user, may switch from an internally generated tones to an external audio source, from auditory stimuli to tactile and/or visual stimuli, and the like. Of course, such alternation characteristics of any sensory input may be preselected by the operator of the system of the present invention.

The audio and tactile portion of the system of the present invention may be used in conjunction with visual scanning devices such as that found in United States Patent 5,343,261 and our patent application serial number 09/094,394, filed 9 June 1998, which is incorporated by reference in its entirety to this application. That is to say, alternating tones may be coordinated with alternating visual signals of varying types.

It may be apparent that a novel and useful device for applying stimuli to a subject for the purpose of therapy has been hereinabove described.

It is therefore an object of the present invention to provide a device for applying therapeutic stimuli to a subject which employs multiple single sensory mode stimuli in a coordinated fashion.

Another object of the present invention is to provide a device for applying therapeutic stimuli to a subject which utilizes audio tones which are alternatively delivered to the left and rights ears of a subject.

Another object of the present invention is to provide a device for applying therapeutic stimuli to a subject which employs audio signals and tones that are delivered alternatively to the left and right ears of the subject and is triggered by a variable body characteristic, such as body temperature, the galvanic skin response, blood pressure, pulse rate, and the like.

Yet another object of the present invention is to provide a device for applying therapeutic stimuli to a subject which is

useful as a desensitization apparatus, and, thus serves as a tool in psychological treatment.

Another object of the present invention is to provide a device for applying therapeutic stimuli to a subject which may be employed to treat an individual or a plurality of persons simultaneously, for example, in psychotherapy with couples.

A further object of the present invention is to provide a device for applying therapeutic stimuli to a subject which delivers multiple stimuli to a patient or patients and is manually adjustable, preprogrammed, or triggered by physiological events.

Another object of the present invention is to provide a device for applying therapeutic stimuli to a subject which is modular in nature and may be upgraded or downgraded commensurate with features desired by the therapist employing such a device.

Another object of the present invention is to provide a device for applying therapeutic stimuli which employs audio sources that are internally generated or found external to the system.

Yet another object of the present invention is to provide a device for applying therapeutic stimuli to a subject which uses an audio signal that is directed individually and simultaneously to the ears of the patient in a sequential fashion.

A further object of the present invention is to provide a device for applying a variety of audio therapeutic stimuli to the ears of a subject or subjects in a alternating or bilateral fashion, such as tones, music, relaxation sounds, affirmations, prayers, and the like.

The invention possesses other objects and advantages especially as concerns particular characteristics and features thereof which will become apparent as the specification continues.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a block diagram describing in detail the operation of the device of the present invention.

Fig. 2 is a schematic block diagram detailing the electrical interaction of the electrical components of the present application.

Fig. 3 is a schematic front view of the panel of the audio scanning portion of the present invention.

Fig. 4 is a front view of stacked components, of the present invention.

For a better understanding of the invention reference is made to the following detailed description of the preferred embodiments thereof which should be taken in conjunction with the prior described drawings.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Various aspects of the present invention will evolve from the following detailed description of the device of the present invention which must be referenced to the accompanying drawings to achieve a full understanding of the invention.

The invention as a whole is shown in the drawings by reference character 10. Device 10 includes as one of its elements a microprocessor U3, Fig. 1. Microprocessor U3 may be of the type with the designation 68HC705. Microprocessor U3 serves to direct and to coordinate multiple inputs and outputs in the system 10 of the present invention. The programmed binary code for U3 is attached hereto as Appendix I. For example, audio source 12 an external audio input 14, such as a tape recorder, CD drive, and the like which passes to stereo to monaural converter 16. Audio source 12 may also take the form of internal audio source 18 is capable of generating a single tone or a multiplicity of tones. For example, eight notes of a scale (CDEFGABC) may be employed in this regard. Switch means SW3 permits the user of device 10 to select internal tone generator 18 or external audio input 14 into audio switch 20. Internal tone generator 18, separately depicted, originates in microprocessor U3. Tone control output 40 from U3 passes to right/left volume control and audio switch 20. The output of audio switch 20 passes to J2 headphones 22 which is worn by the user or patient being treated by the clinician who operates device 10. Headphones 22 may receive a continuous tone alternated from the left side to the right side of the headphones. In the bridge mode,

the external audio source 14 is heard by the user or patient wearing headphones 22, first in the right ear, followed by both the left and right ears, and, finally, the left ear from the corresponding sides of headphones 22. Thus, in the bridge mode there is never a time that one side or the other of headphones 22 is not switched on. A discrete mode may also be employed, through right/left volume control 20, in which a tone is heard momentarily in each ear through head phones 22 in this case. Thus, in the discrete mode, there is a period of time when neither the left or right portions of headphones 22 is switched on. Thus, these elements comprise means 24 for delivering selected audio tones to the left and right ears of the subject. Switch SW5 is capable of selecting a particular note to be fed into microprocessor U3 for use in headphones 22. In addition, speed adjustment 30 is capable of varying the periodicity of a particular note. It should be apparent that the audio signal to head phones 22 may be split for use in multiple headsets.

Means 26 is also depicted for quantifying a variable body characteristic of the subject or patient. Such means 26 is labeled as J4 body param on Fig. 1. Means 26 may acquire the pulse rate, body temperature, blood pressure, eye blink rate, galvanic skin response (GSR), and the like from the patient. Such signal is sent to the parameter amplifier 28 and then to microprocessor U3. For example, means 26 may acquire the pulse from the patient through a finger clip, ear clip, or a similar type device of conventional configuration. A gain adjustment allows a weak signal from means

26 to successfully be inputted to microprocessor U3. After a time period, microprocessor U3 calculates an average pulse rate and turns on normalized LED 31 so that the particular parameter of the patient may now be used as a reference. The operator or clinician pushes SW4, parameter normalized switch, the connecting of switch SW4 will cause the audio switch 20 to select a particular tone to be sent to audio speaker means 22 in the form of headphones. In this mode, SW3 would be set to internal tone source 18. U3 may be programmed to automatically change tones sent from internal output 18 to headphones 22, dependent on the level fed to microprocessor U3 via parameter output 28.

Further, microprocessor U3 may send a visual signal through leg 32 to visual output buffer 34 which is then passed to visual display 36. Visual display 36 may take the form of a light bar, light panel, light goggles, and the like described in United States Patent 5,343,261. Microprocessor U3 is able to coordinate periodic tones to headphones 22 with visual signals passing through leg 32 to visual display 36.

Moreover, a tactile signal 38 leaves microprocessor U3 and pass to a plurality of voltages switches 40 for a tactile probe or probes 42. Tactile probe 42 may simply take the form of a vibrator that is intended to be held by the hands or pressed against the skin of the patient. Again, the tactile signal 38 may be coordinated with the tone output through leg 40 and the visual signal through leg 32. Thus, any stimuli, sonic, tactile, or visual, are acquired by the patient alone or in combination.

With reference to Fig. 2, it may be observed that the particular circuitry used in the present invention is shown. J3 represents the connector plug for the external audio source. Capacitors C1 and C2, in conjunction with resistors R1 and R2, comprise the stereo-to-monaural 16 converter. The monaural signal passes through leg 42 to switch SW3 which determines the source of the audio output from U3. U3 oscillator 44 passes through Schmidt trigger U1. Capacitor C1 acts as a filter. Oscillator 44 is capable of generating internal tones either singularly or along a scale. U4 serves as a multiplexor and receives three signals from U3. Multiplexor U4 feeds headphones 22 (J2) having a right volume control 46 and a left volume control 48. Switch SW5 determines one of eight internally generated tones, deriving from oscillator 44, sent to microprocessor U3. Resistor R6 regulates the rate of alternation of tones between the left and right sides of headphones 22, and is essentially an analog-to-digital converter. Thus, R6 controls the rate of switching of the multiplex tones traveling from left to right in headset 22. Resistors 46 modulate the signals from SW5 and are considered to be pull-up resistors. SW2, controlled by the clinician, determines the "bridge mode" or "discrete mode" for tones emanating from internal tone output 18.

Oscillator Y1 is a reference oscillator and produces a time base used by microprocessor U3. Oscillator Y1 acts in conjunction with C5, C6, C8, and R7 in this regard. U3 generates a reset pulse to reset pin 48. Following the charging of C9, the reset function of U3 is turned off.

Turning to CR3 and CR4, such diodes serve as visual indicators to the right side and left side of headphone 22, respectively. Thus, the clinician is able to instantly perceive which part of headset 22 is activated when used by the patient. R10 serves as a current limiter.

Turning to means 26, a human parameter or physiological characteristic, such as pulse rate, GSR, temperature, and the like, is quantified. J4 serves as the input and CR5 serves as an indicator 31, Fig. 2, of the same when a normalized parameter has been achieved. As prior explained, this is performed through an averaging of, say pulse rate, over a period of time by U3. U2 serves as an amplifier for the signal generated by pulse sensor 50. U1 produces a square wave signal of a digital nature, the output of which is fed into microprocessor U3. CR6 indicates the input to U2. The power input to system 10 on Fig. 2 is indicated at various areas by a number followed by the letter "V". For example, plus 5 volts and minus 5 volts are fed into operational amplifier U2.

J5 represents a tactile probe or probes 42 and is driven by a voltage, +V at transistors Q1, Q2, and Q3. In certain cases, the voltage, +V is at or about 9 volts. Again, microprocessor U3 generates a signal to operate transistor switches Q1, Q2, and Q3 to activate tactile probes 42. CR1 is a back EMF suppression diode which protects Q1, 2, and 3 from inductive kickback from conventional motors employed with tactile probes 42.

SW4 is the parameter normalized switch that permits the clinician to begin the body parameter input to U3 when such body parameter has been normalized. In other words, when the patients pulse rate reaches a normal level, SW4 is pushed.

Again, when the body parameter, i.e. pulse enters J5, tones may be initiated in headphones J2 through microprocessor U3. A rise in pulse from the average pulse determined at SW4 is able to switch tones at SW5 in a sequential fashion. For example, a rise in pulse may produce a tone which is higher or lower than the prior tone fed to headphones J2, and vice versa. In this regard, the "discrete bridge" function is operated through SW2. That is to say, internal tones generated by oscillator 44 and U1, by the selection through SW3, will alternately travel to the left ear, both the left and right ears, and the right ear of the patient in this sequence. Switching SW2 brings in the "discrete mode" in which the sound is passed to headphones J2 alternately, left and right without both ear phones 54 or 56 (Fig. 3) being activated. In other words, a sound gap exists between the alternating left and right sounds received by the patient's ears.

J6 represents the optional visual output portion of device 10 in which a light bar, such as that shown in United States Patent 5,343,261 may be employed and be coordinated with the alternating tones passing to headphones J2, as well as tactile probes at J5.

The following is a table representing typical components used in the circuitry found in Fig. 2.

TABLE OF COMPONENTS

	Component	Value or Identification
	C1	0.1F
	C2	0.1F
5	C3	0.1F
	C4	10 μ F
	C5	47pF
	C6	47pF
	C7	0.1F
10	C8	0.1F
	C9	10 μ F
	C14	10 μ F
	C15	100 μ F
	C16	0.1F
15	R1	180 Ω
	R2	180 Ω
	R3	10K Ω
	R4	10K Ω
	R5	390 Ω
20	R6	10K Ω
	R7	10M Ω
	R9	10K Ω
	R10	390 Ω
	R11	1K Ω
25	R12	20K Ω
	R13	20K Ω
	R14	1K Ω
	R15	1K Ω
	R16	1K Ω
30	R17	390 Ω
	R18	390 Ω
	RN1	10K Ω
	U1	74HCT14
	U2	LT1097
35	U3	68HC705
	U4	4052
	Q1	2N3906
	Q2	2N3906
	Q3	2N3904
40	CR2-CR6	1N914

Figs. 3 and 4 shows a housing 52 permitting the clinician to operate device 10. Headset 22 is depicted schematically having left ear piece 54 and right ear piece 56.

Fig. 4 indicates that an external audio source 14 may be jacked into audio portion 52 shown in Fig. 3. Other components 58,

such as the visual component J6, the tactile component J5, the parameter sensor 26, and the like may be stacked in a modular way. That is to say, portions of system 10, of the present invention, may be used alone or in combination as desired by the clinician.

5 While in the foregoing, embodiments of the present invention have been set forth in considerable detail for the purposes of making a complete disclosure of the invention, it may be apparent to those of skill in the art that numerous changes may be made in such detail without departing from the spirit and principles of the invention.

WHAT IS CLAIMED IS

1. A device for applying therapeutic stimuli to a subject,

comprising:

5 a. an audio source providing a selected audio tone; and
b. audio speaker means for delivering said selected audio tone to the left and right ears of the subject, said audio speaker means alternating delivery of said audio tone to the subject's left ear, both the left and right ears, and the right ear of the listener.

10 2. The device of claim 1 in which said audio source comprises means for generating a selected audio tone.

15 3. A device for applying therapeutic stimuli to a subject,

comprising:

15 a. an audio source providing a selected audio tone;
b. audio speaker means for delivering said selected audio tone to the left and right ears of the subject, said audio speaker means alternating delivery of said audio tone to the subject's left ear, and the right ear of the listener; and

20 c. means for acquiring an external audio tone and inputting means for transmitting said external audio tone to said audio speaker means.

25 4. The device of claim 1 in which said audio speaker means is a headphone.

5. The device of claim 3 in which said audio speaker means is a headphone.

6. The device of claim 1 which additionally comprises means for quantifying a variable body characteristic of the subject and producing a body characteristic signal, and said audio source further includes means for providing a plurality of audio tones and means for selecting one of said audio tones dependent on said quantified variable body characteristic.

7. The device of claim 6 in which said means for quantifying a variable body characteristic further comprises means for initiating said quantifying of said variable body characteristic, and an indicator of the rate of change of said variable body characteristic.

8. The device of claim 1 which additionally comprises means for providing a visual display commensurate with said alternating delivery of said audio tone.

9. The device of claim 1 which further comprises a tactile output commensurate with said alternating delivery of said audio tone.

10. The device of claim 9 which additionally comprises means for providing a visual display commensurate with said alternating delivery of said audio tone.

11. The device of claim 1 which further comprises speed adjusting means for determining the time interval between said alternating of said audio tone between the left ear and right ear.

12. A device for applying stimuli to a subject,
comprising:

a. an audio source providing a plurality of audio tones;

b. means for quantifying a variable body characteristic of
5 the subject and producing a body characteristic signal; and

c. audio speaker means for delivering of a certain audio
tone of said plurality of audio tones alternately to the left ear
and to the right ear of the subject, said audio source further
including means for selecting one of said audio tones dependent on
said quantified variable body characteristic.
10

13. The device of claim 12 which additionally comprises
means for providing a visual display commensurate with said
alternating delivery of said audio tone.

14. The device of claim 13 in which said audio source
comprises means for generating a selected audio tone.
15

15. The device of claim 14 in which said audio speaker
means is a headphone.
20

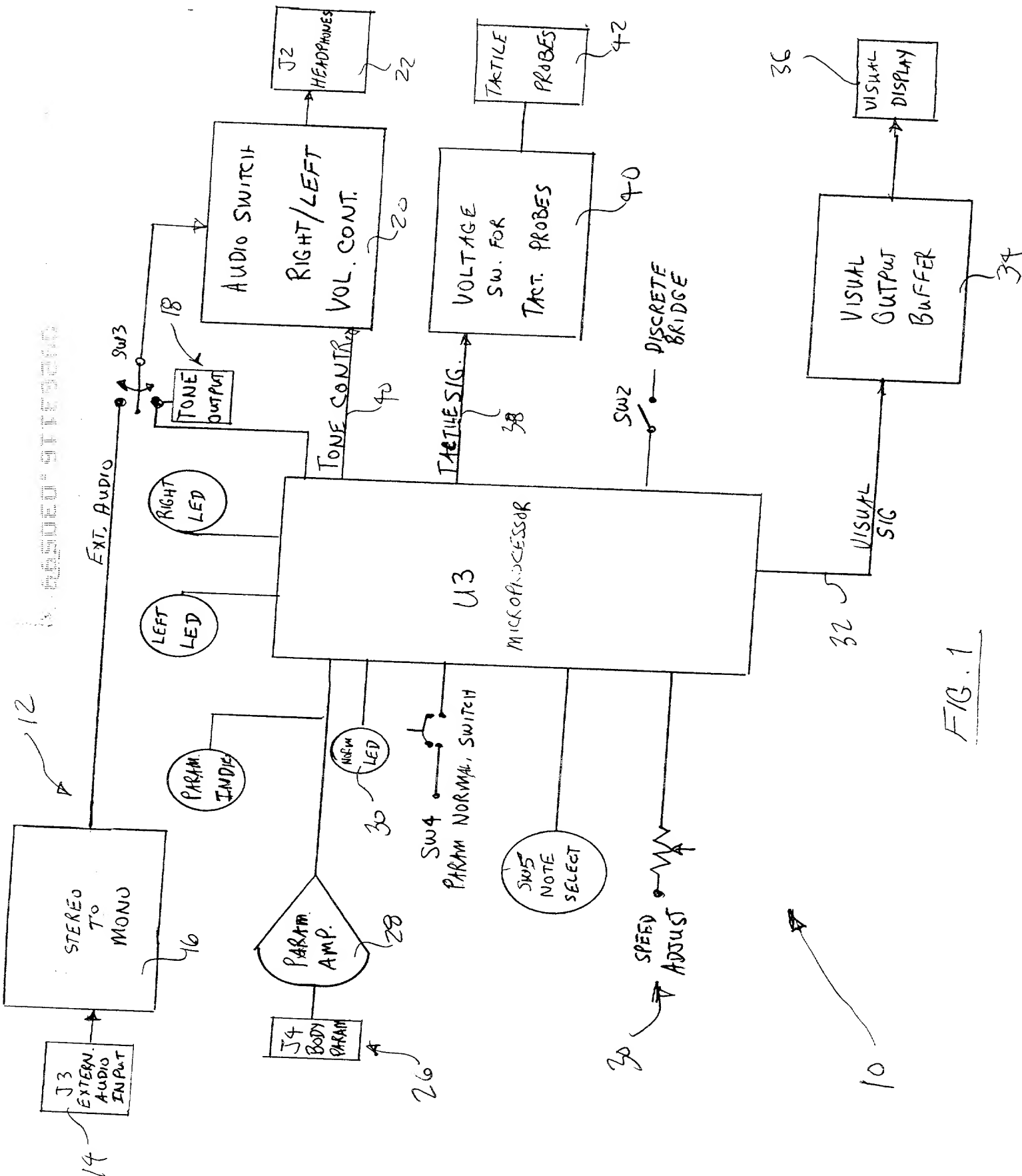


FIG. 1

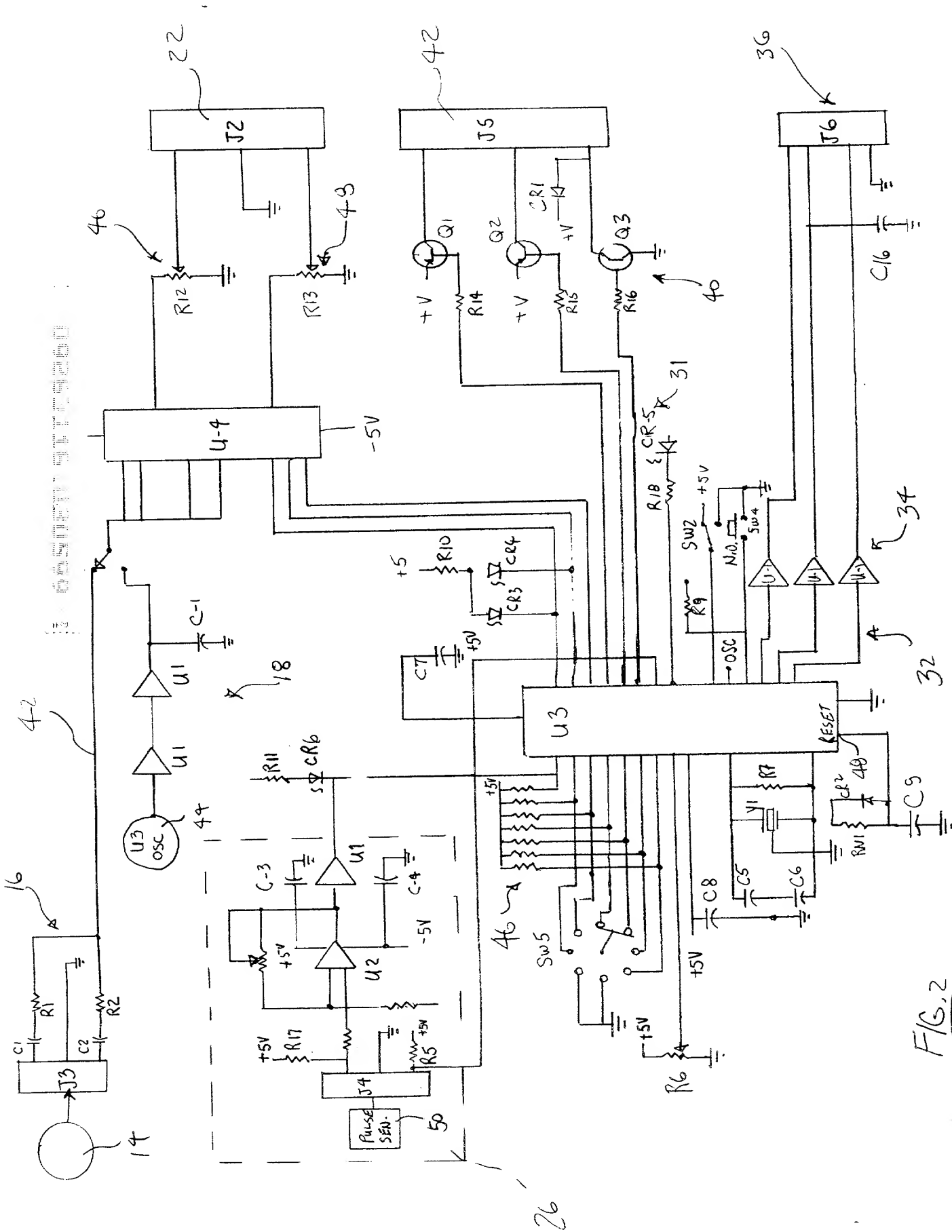


FIG. 2

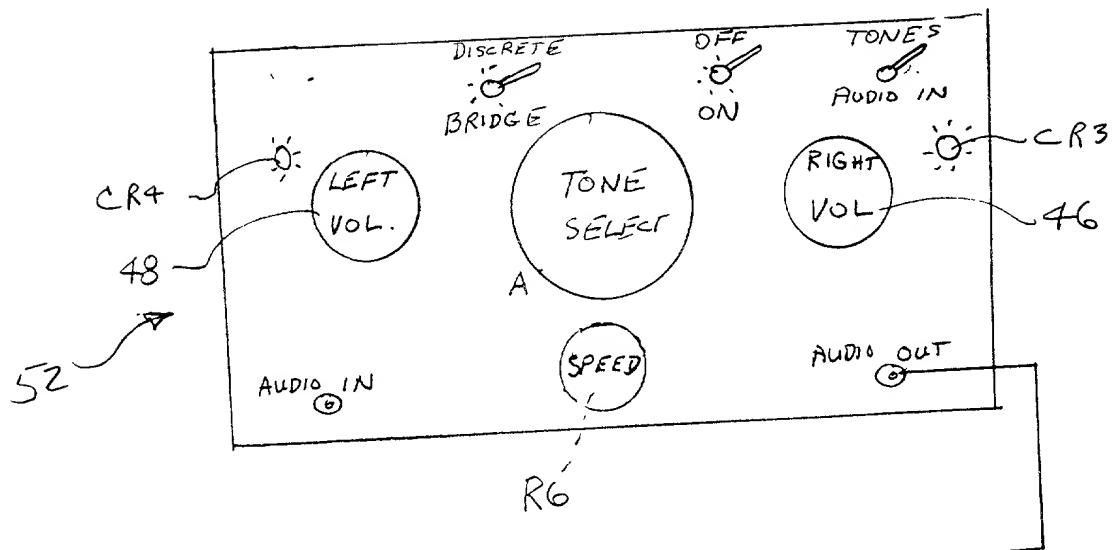
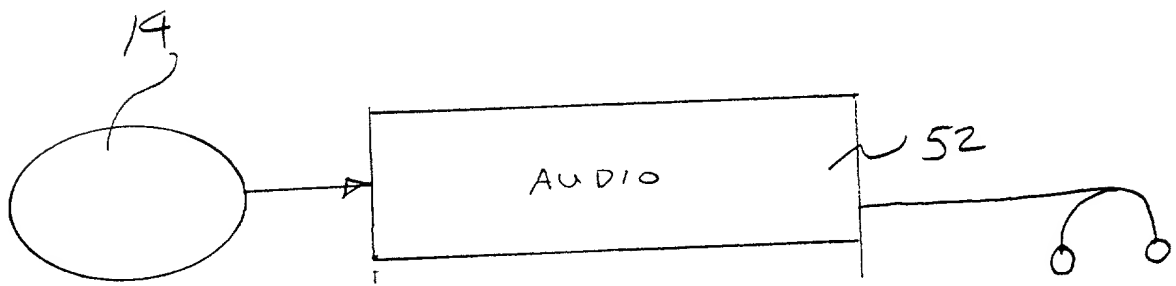
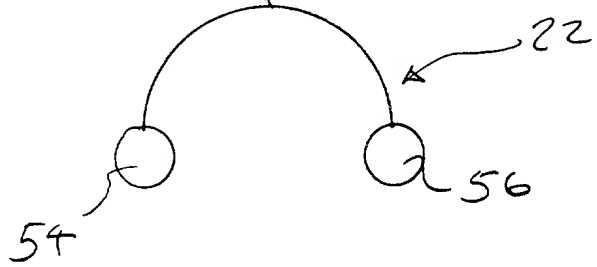


FIG. 3



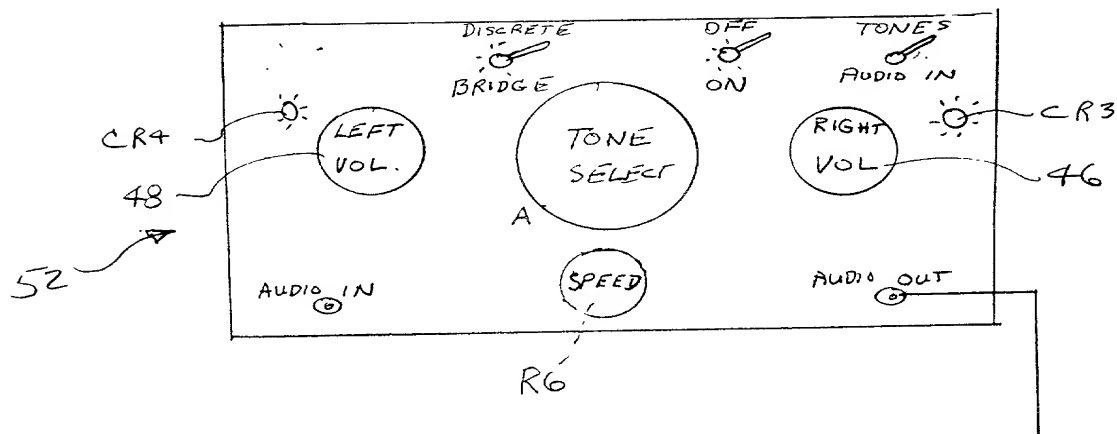


FIG. 3

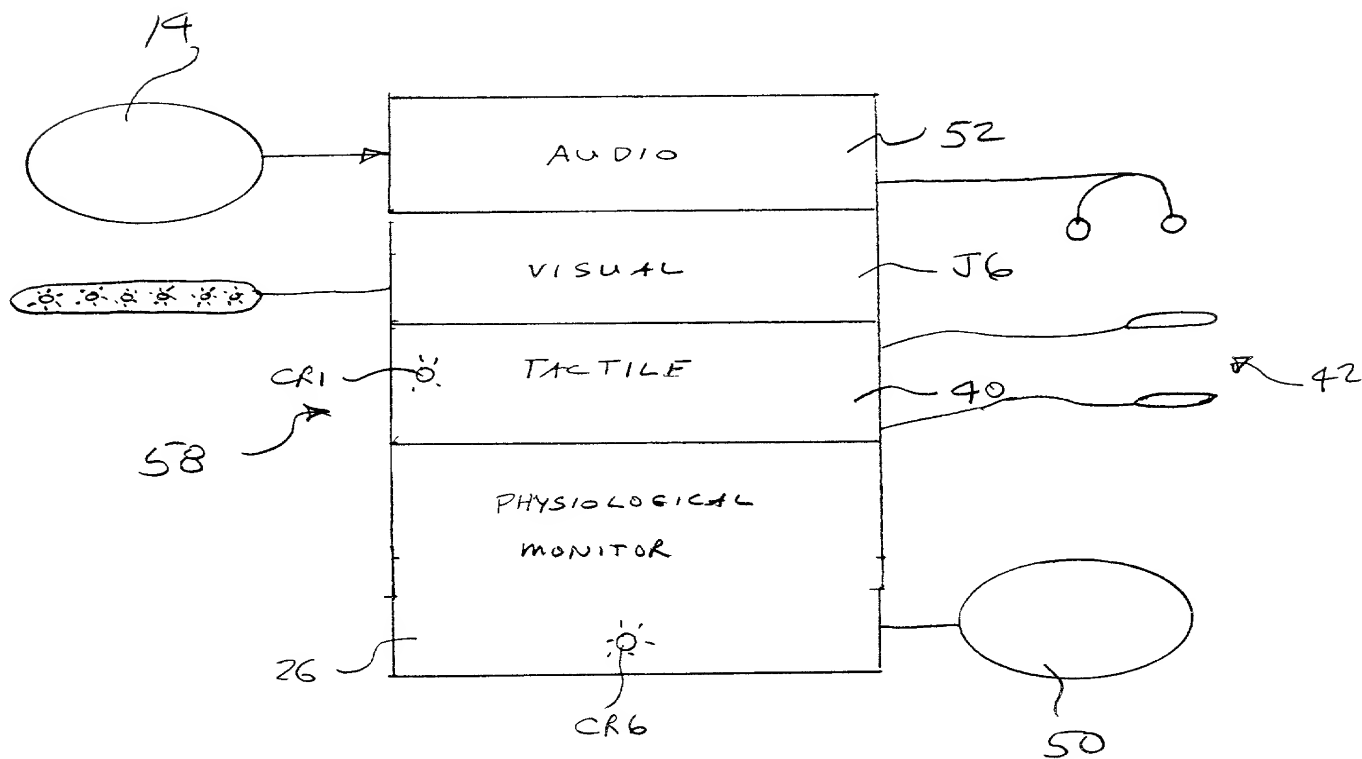
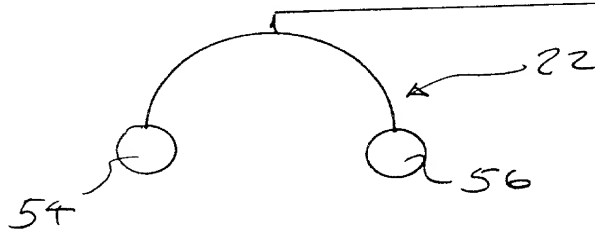


FIG. 4

**COMBINED DECLARATION AND POWER OF ATTORNEY
IN ORIGINAL APPLICATION**

Atty Dkt. No: 13274

As a below named inventor, I hereby declare that:
My residence, post office address and citizenship are as stated
below next to my name.

I believe I am the original, first and sole inventor (if
only one name is listed below) or an original, first joint
inventor (if plural names are listed below) of the subject matter
which is claimed and for which a patent is sought on the
invention entitled:

DEVICE FOR APPLYING STIMULI TO A SUBJECT

the specification of which X is enclosed herewith or was
filed on as Application Serial No. and was
amended on (if applicable).

I hereby state that I have reviewed and understand the
contents of the above identified specification, including the
claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is
material to the examination of this application in accordance
with Title 37, Code of Federal Regulations, §1.56(a).

I hereby claim foreign priority benefits under Title 35,
United States Code, §119 of any foreign applications(s) for
patent or inventor's certificate listed below and have also
identified below any foreign application for patent or inventor's
certificate having a filing date before that of the application
on which priority is claimed.

Prior Foreign Applications(s):

COUNTRY <u> </u>	APPLICATION NUMBER <u> </u>
DATE OF FILING <u> </u>	PRIORITY CLAIMED UNDER
35 U.S.C.119 YES <u> </u> NO <u> </u>	

COUNTRY <u> </u>	APPLICATION NUMBER <u> </u>
DATE OF FILING <u> </u>	PRIORITY CLAIMED UNDER
35 U.S.C.119 YES <u> </u> NO <u> </u>	

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose material information as defined in Title 37 Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

APPLICATION SERIAL NO. _____ DATE OF FILING _____
STATUS: _____ PATENTED _____ PENDING _____ ABANDONED

APPLICATION SERIAL NO. _____ DATE OF FILING _____
STATUS: _____ PATENTED _____ PENDING _____ ABANDONED

POWER OF ATTORNEY

I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith:

THEODORE J. BIELEN, JR., Registration No. 27,420

RICHARD ESTY PETERSON, Registration No. 26,495

THOMAS R. LAMPE, Registration No. 22,454

Address all calls to:

Theodore J. Bielen, Jr., telephone No: 925/937-1515

Address all correspondence to:

THEODORE J. BIELEN, JR.

Bielen, Peterson & Lampe

1990 N. California Blvd., Suite 720

Walnut Creek, CA 94596

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false

statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

1. Full name of sole of first inventor: David L. Wilson

Inventor's signature: _____ Date: _____

Residence: 616 Azalea Avenue Citizenship: U.S.A.
 Redding, Ca. 96002

Post Office Address: 616 Azalea Avenue
 Redding, Ca. 96002

1. Full name of joint or second inventor: Douglas C. Fisher

Inventor's signature: Douglas C Fisher Date: 7/22/99

Residence: 13705 Braun Rd. Citizenship: U.S.A.
 Golden, CO 80401

Post Office Address: 5151 Ward Road #3
 Wheatridge, CO 80033

COMBINED DECLARATION AND POWER OF ATTORNEY
IN ORIGINAL APPLICATION

Atty Dkt. No: 13274

As a below named inventor, I hereby declare that:
My residence, post office address and citizenship are as stated
below next to my name.

I believe I am the original, first and sole inventor (if
only one name is listed below) or an original, first joint
inventor (if plural names are listed below) of the subject matter
which is claimed and for which a patent is sought on the
invention entitled:

DEVICE FOR APPLYING STIMULI TO A SUBJECT

the specification of which X is enclosed herewith or was
filed on as Application Serial No. and was
amended on (if applicable).

I hereby state that I have reviewed and understand the
contents of the above identified specification, including the
claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is
material to the examination of this application in accordance
with Title 37, Code of Federal Regulations, §1.56(a).

I hereby claim foreign priority benefits under Title 35,
United States Code, §119 of any foreign applications(s) for
patent or inventor's certificate listed below and have also
identified below any foreign application for patent or inventor's
certificate having a filing date before that of the application
on which priority is claimed.

Prior Foreign Applications(s):

COUNTRY APPLICATION NUMBER
DATE OF FILING PRIORITY CLAIMED UNDER
35 U.S.C.119 YES NO

COUNTRY APPLICATION NUMBER
DATE OF FILING PRIORITY CLAIMED UNDER
35 U.S.C.119 YES NO

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose material information as defined in Title 37 Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

APPLICATION SERIAL NO. _____ DATE OF FILING _____
STATUS: _____ PATENTED _____ PENDING _____ ABANDONED

APPLICATION SERIAL NO. _____ DATE OF FILING _____
STATUS: _____ PATENTED _____ PENDING _____ ABANDONED

POWER OF ATTORNEY

I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith:

THEODORE J. BIELEN, JR., Registration No. 27,420

RICHARD ESTY PETERSON, Registration No. 26,495

THOMAS R. LAMPE, Registration No. 22,454

Address all calls to:

Theodore J. Bielen, Jr., telephone No: 925/937-1515

Address all correspondence to:

THEODORE J. BIELEN, JR.

Bielen, Peterson & Lampe

1990 N. California Blvd., Suite 720

Walnut Creek, CA 94596

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false

statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

1. Full name of sole of first inventor: David L. Wilson

Inventor's signature: David L. Wilson Date: 2/22/99

Residence: 616 Azalea Avenue Citizenship: U.S.A.
 Redding, Ca. 96002

Post Office Address: 616 Azalea Avenue
 Redding, Ca. 96002

1. Full name of joint or second inventor: Douglas C. Fisher

Inventor's signature: _____ Date: _____

Residence: 13705 Braun Rd. Citizenship: U.S.A.
 Golden, CO 80401

Post Office Address: 5151 Ward Road #3
 Wheatridge, CO 80033